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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MOTOROLA INC 600 NORTH US HIGHWAY 45 ROOM AS437 LIBERTYVILLE, IL 60048-5343			JENKINS, KIMBERLY YVETTE	
			ART UNIT	PAPER NUMBER
			2635	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,987

Applicant(s)

ARNES, THEODORE

Examiner

Kimberly Jenkins

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23, 27, 29-31 and 36 is/are rejected.
- 7) ☒ Claim(s) 24, 25, 26, 28 and 32-35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/10/04, 10/13/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5, 7-9, 11-13, 18-19, 29 and 31 rejected under 35 U.S.C. 102(b) as being anticipated by Engle et al. (US 5541622).

Regarding claim 1, Engle, who teaches an electronic device with keyboard, expressively discloses the keyboard assembly as comprising a switch (read as “keyswitch, col. 3, lines 38-45); a first force sensing region 169 for acquiring a first force value and a second force sensing region 169 for acquiring a second force value (col. 6, lines 36-57), wherein there is more than one force-sensing element/region); and a processor coupled to the switch wherein the first force sensing region and the second force sensing region, for determining a selected function for the key based upon the first force value and the second force value when the switch is activated (col. 6, line 64 – col. 7, line 2, wherein the values are the applied forces to the force-sensing elements).

Regarding claim 2, Engle discloses an electronic device wherein the first force sensing-region and the second force-sensing region comprise: a partially resistive

material (read as force sensing resistor FSR), which exhibits a force-to-voltage response value (col. 6, lines 15-20 and col. 3, line 66-col. 4, line 3).

Regarding claim 3, Engle discloses an electronic device further comprising: a third force sensing region for acquiring a third force value upon activation of the switch (col. 10, lines 7-15). Engle discloses a processing unit that is coupled to first and second force sensing regions, and it is inherent for the processing unit to be couple to the third force sensing region in order to determine the selected function for the key based upon the first force value, the second force value, and the third force value when the switch is activated.

Regarding claim 4, Engle discloses the selected function is a primary function when the first force value, the second force value, and the third force value are all below a stored threshold value (col. 6, lines 20-42, wherein a the force applied is compared to a pre-determined load force).

Regarding claim 5, Engle expressively discloses the selected function is a secondary function when the first force value exceeds a stored threshold value (col. 3, lines 55-63).

Regarding claim 7, Engle discloses an actuator (key) positioned above the switch, for activating the switch upon receipt of at least a predetermined amount of pressure (col. 3, lines 64-66 and col. 5, lines 40-45). In addition, Engle discloses an optional

embodiment wherein actuator 242 comprises a switch mechanism 244 (col. 9, lines 60-63).

Regarding claim 8, Engle discloses the actuator comprising a plunger 162 positioned above the switch (col. 7, lines 4-8).

Regarding claim 9, Engle discloses the key comprising a popple dome 166, which is deformed when the plunger 166 is depressed thereon, positioned under the plunger 162 (col. 7, lines 10-14).

Regarding claim 11, Engle discloses a plurality of central switches (col. 5, lines 44-45 and col. 3, lines 64-66), wherein one or more satellite force sensing regions located around each of the plurality of central switches; and an actuator for at least one central switch, each actuator having a first side adapted for receiving an externally applied force, and a plurality of contact surfaces 172 (keyboard membrane) on a second side (col. 5, lines 35-38), the plurality of contact surfaces on the second side corresponding to the at least one central switch and one or more associated satellite force sensing pads 168 (col. 5, lines 39-44), wherein the actuator has multiple actuations, each actuation being distinguishable by an evaluation of the forces sensed by the one or more associated satellite force sensing pads (col. 3, lines 40-50).

Regarding claims 12-13, Engle discloses at least one of the one or more satellite force sensing pads 168 is associated with at least one of the plurality of central switches (col. 5, lines 44-45).

Regarding claim 18, Engle discloses processor coupled to the plurality of central switches by way of the force sensors 168 and one or more satellite force sensing pads, wherein the processor is adapted for comparing the forces sensed by the satellite force-sensing pads when one of the plurality of central switches is activated and, based at least in part upon the comparison, distinguishing among the multiple actuations (col. 6, line 64-col. 7, line2).

Regarding claim 19, Engle discloses a cover 152 (having an opening through which at least some of the first side of the actuator is exposed (Fig. 1A).

Claim 29 is rejected for the same reasons as claim 7.

Claim 31 is rejected for the same reasons as claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6, 10, 14-17, 20-21, 22-23, 25-27, 27, 30, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engle et al. (US 5541662) in view of Krishnan (US 6377685).

Regarding claim 6, Engle discloses an electronic device wherein the selected function is a primary function of entering a character from a keyboard (col. 5, lines 39-40); however, Engle does not disclose the character from a group having 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, and #.

However, Krishnan, who teaches a cluster key arrangement with satellite regions, expressively discloses the actuator as having a primary function of entering characters from 0-9 (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the character selection to be numerical as Krishnan discloses, because Engle discloses the actuator device as being a part of a keyboard, which are conventionally alphanumeric, whereas Krishnan discloses the actuators as providing the numbers to be selected.

Regarding claim 10, Engle discloses the actuator comprises a plunger 162 positioned above the switch (col. 7, lines 4-8). Engle discloses a first satellite region and second satellite region, which is the direction of which the actuator may move, i.e. forwards, backwards, along the x- or y- axis (col. 6, lines 39-50). The plungers, which is

a component of the actuator assembly 150, are located in the force sensing region 168 (col. 5, lines 35-39 and col. 7, lines 29-31).

Regarding claim 14, Engle discloses each of the force sensing pads 168 as being associated with the movement of the actuator in satellite regions (various directions) (col. 6, lines 47-53); however, Engle does not disclose a character as being selected.

However, Krishnan discloses satellite regions (cluster key that is multi-directional and multi-functional) as being associated with the different character input (col. 17, lines 28-40 and Figs. 1-2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the satellite regions to be associated with the character selection of Krishnan into the satellite regions of Engle, because Engle discloses the actuator as having satellite regions in order for a force to be applied on a keyboard, and Krishnan discloses the satellite regions as being in association with the character selection on the actuator to make the actuator multi-functional; the keyboard more compact; and cost efficient.

Regarding claim 15, Engle discloses one actuator assembly (col. 5, lines 23-27) for keyboard operations; however, Engle does not multiple actuators as being associated with a different character input.

However, Krishnan discloses a plurality of actuators 12 with secondary keys 14 for character selection (col. 14, lines 15-23 and Fig. 1). Therefore, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to have multiple actuators associated with different characters as suggested by Krishnan, because Engle discloses a primary actuator, whereas Krishnan discloses multiple actuators for character selections as means to minimize the size and cost of keyboards and/or keypads.

Regarding claim 16, Engle discloses the actuator as having an elongated shaper (Fig. 1A); however, does not disclose the shape as being triangular.

However, Krishnan notes prior art of multi-functional actuators as having a triangular shape (col. 4, lines 61-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the actuator to a triangular shape as disclosed in Krishnan, because Engle discloses an elongated actuator for easy movement manipulation by the user, whereas Krishnan disclose the triangular shape as being means to provide multiple characters as being selected from one actuator.

Regarding claim 17, Engle discloses the actuator as being elongated (Fig. 1A); however, Engle does not disclose the shape as being a quadrilateral.

However, Krishnan discloses the actuator as being rectangular (col. 16, lines 60-63). Therefore, it would have been obvious at the time the invention was made to make the actuator of Engle a rectangular shape to provide more contact as suggested by

Krishnan, because Engle discloses an elongated actuator, whereas Krishnan discloses an optional rectangular (a rectangle is a quadrilateral) to provide more finger space to maneuver the actuator.

Regarding claim 20, Engle discloses the keypad/keyboard (col. 5, lines 39-40); however, Engle does not disclose the keypad/keyboard as being used as part of a wireless communication device.

However, Krishnan discloses the keypad of being a part of wireless communication devices, such as cellular/mobile phones and Personal Digital Assistants (PDA) (col. 6, lines 49-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time have the keyboard of Engle to be a component of a wireless device, because Engle discloses a keyboard, whereas Krishnan discloses a keyboard (keypad) as being a part of a wireless communication device in that they actuators therein can have multi-directional and multi-functional capabilities to promote a user-friendly wireless communication device.

Regarding claim 21, Engle discloses the keyboard assembly with an actuator that is coupled to a switch and sensor assembly; however Engle does not disclose a secondary key press that is detected when a one of the plurality of central switches is activated and a maximum difference between the forces sensed by the one or more

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satellite force-sensing pads located around the one of the plurality of central switches is greater than a stored threshold value.

However, Krishnan discloses a secondary key press 14 that is detected when on of the plurality of switches, which are conventional components of keys of a keyboard/keypad, is activated when the switch value is greater than the threshold wherein the key-depressed state is acknowledged according to the processing unit (col. 17, lines 41-54).

Regarding claim 22, Engle discloses the keyboard assembly with an actuator that is coupled to a switch; however, Engle does not discloses the basic algorithm of a primary key press detected when one of the plurality of central switches is activated and a maximum difference between forces sensed by the one or more satellite force sensing pads located around the one of the plurality of central switches is less than a stored threshold value.

However, Krishnan discloses the detection of the primary key depression opposed to the depression of the secondary keys (and corresponding "satellite regions") is that when the primary key is pressed, the secondary keys will not contact the substrate, which in turn does not contact the switches of the other keys (col. 18, lines 55-59 and col. 24, lines 37-39). In addition, the acknowledgement of the key-depressed state corresponds to the microprocessor and the logic unit, which have stored values of

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"1" (high/on) and "0" (low/off) (col. 18, line 60-col. 19, line 1 and col. 20, lines 48-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have at least one of the switches to have stored value, which is stored in the memory of the microprocessor, because Engle discloses a central switch of a key, whereas Krishnan has the value (from the logic unit) that is stored in order to compare if the value to the key-depression state in order to eliminate incorrect alphanumeric data to be displayed.

Claim 23 is rejected for the same reasons of claim 21.

Regarding claim 27, Engle discloses force-sensing elements wherein the greater force sensed will provide the actuation of the operator (col. 6, lines 44-57); however, Engle does not disclose a keypad wherein a secondary key press is detected based upon the associated satellite force-sensing pad having the greatest force detected when one of the plurality of central switches is activated.

However, Krishnan discloses a secondary key press 14 wherein the greater force detected will cause the central switch to be activated when sensed in the corresponding satellite region (direction) (col. 15, lines 23-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the greatest force to be detected in order to activate the switch of the secondary key as suggested by Krishnan, because Engle discloses force-sensing elements that is compared by the

processor, whereas Krishnan discloses the secondary key press is detected based upon the greatest applied force in order to eliminate display of incorrect alphanumeric characters in the event that more than one key was pressed simultaneously.

Claim 30 is rejected for the same reasons as claim 6.

Regarding claim 36, the limitations therein are those of rejected claims 1 and 7 with the additional limitation of a fourth sensing region and a fourth force value. Engle discloses three sensing regions and force values; however, Engle does not disclose a fourth sensing region or a fourth force value.

However, Krishnan discloses a fourth force-sensing region, for acquiring a fourth force value (Fig. 1 illustrates a fourth sensing region by way of the secondary keys 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a fourth force-sensing region into the system of Engle, because Engle discloses three regions, whereas Krishnan discloses at least four regions in that the key may have more operability and functionality to perform multiple functions in order to minimize the size of the electronic device and to minimize manufacturing costs.

Allowable Subject Matter

3. Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because prior art of record does not disclose the the basic algorithm of a primary key press and a secondary key press is detected, a user replaces the detected key press with the other one of the primary key press and the secondary key press, at least one stored threshold value as being updated .

4. Claims 25-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because prior art of record does not disclose the processor of the keyboard to reduce or increase the stored threshold value of force.

5. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because prior art of record does not disclose the primary key is selected when the value is below the stored threshold value.

6. Claims 32-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because prior art of record does not disclose algorithms of a step of selecting a primary function when a difference between the first force value and the second force value is below a predetermined threshold; the step of

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selecting a secondary function when a difference between the first force value and the second force value is above a predetermined threshold; the step of selecting a primary function when the first force value and the second force value are below a predetermined threshold; nor the step of selecting a secondary function when the first force value is above a predetermined threshold.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Brandenburg et al. (US 5499041) teaches a keyboard integrated pointing device with force sensors therein.
- Brown et al. (US 5701142) teaches a pointing stick with a tripod actuator for a computer keyboard.
- Sellers (US 5995026) teaches a force-sensing keyboard.
- Young (US 5241308) teaches a force-sensing touch panel.
- Schultz (US 5184120) teaches a force-sensing means for a portable communication device.
- Yaniger et al. (US 5659334) teaches a force-sensing pointing device.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly Jenkins whose telephone number is 571.272.3064. The examiner can normally be reached from Monday – Friday between the hours of 7am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on 571.272.3068. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimberly Jenkins
Examiner
Art Unit 2635
17 May 2005

KJ

MICHAEL HORABIK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

